Smartphone Interventions to Improve Cognitive Functions in Elderly: A Systematic Review

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Aims and objectives: This systematic review was conducted to explore the effectiveness of interventions smartphone applications to improve cognitive function in *elderly*.

Background: Owing to the advances in medical technology, many chronic illnesses can be early discovered and treated. In recent years, the patient diagnosed with dementia has increased year by year. However, there is no effective treatment to slow down the decline of cognitive function. So the old adults can live for a long time but the quality of life is gradually decreasing.

Methods: In this *systematic review*, we quantified the processes *used* to identify improving cognitive function in old adults by smartphone applications (Apps) published between January 2013 and March 2018 *were eligible* for this *study*. Exclusion criteria were as follows: (a) severe cognitive impairment such as Alzheimer's disease; (b) need for immediate medical attention due to potential neurocognitive impairment as suggested by the present study's screening tests for neurocognitive function; (c) and indication of untreated major depression or other major mental illness. The results were collected and synthesized in this study.

Results: A total of 737 citations from PubMed, Cochrane Library, CINAHL, CEPS and Google Scholar were identified. All articles were excluded due to that enrolled participants are non-use smartphones, non-old adults or non-focus on cognitive function. *There were* only seven *articles* eligible for inclusion. Among these seven articles, most old adults used mobile applications for six to twelve weeks for attention, memory, working memory, and response inhibition memory. The most frequent outcome measured in the studies was improvement the cognitive function of old adults.

Conclusions: Smartphone applications can be used to improve the cognitive function of the old adults, and the smartphone is very convenient to carry and can be used to receive new knowledge anytime and anywhere. In the future, smartphone applications might be widely used to slow down cognitive impairment for the old adults. All of the smartphone interventions that were demonstrated a beneficial impact of text messaging or application for improving of cognitive functions in the old adults. This innovative technology has many implications for clinical nurses in future practice and research.
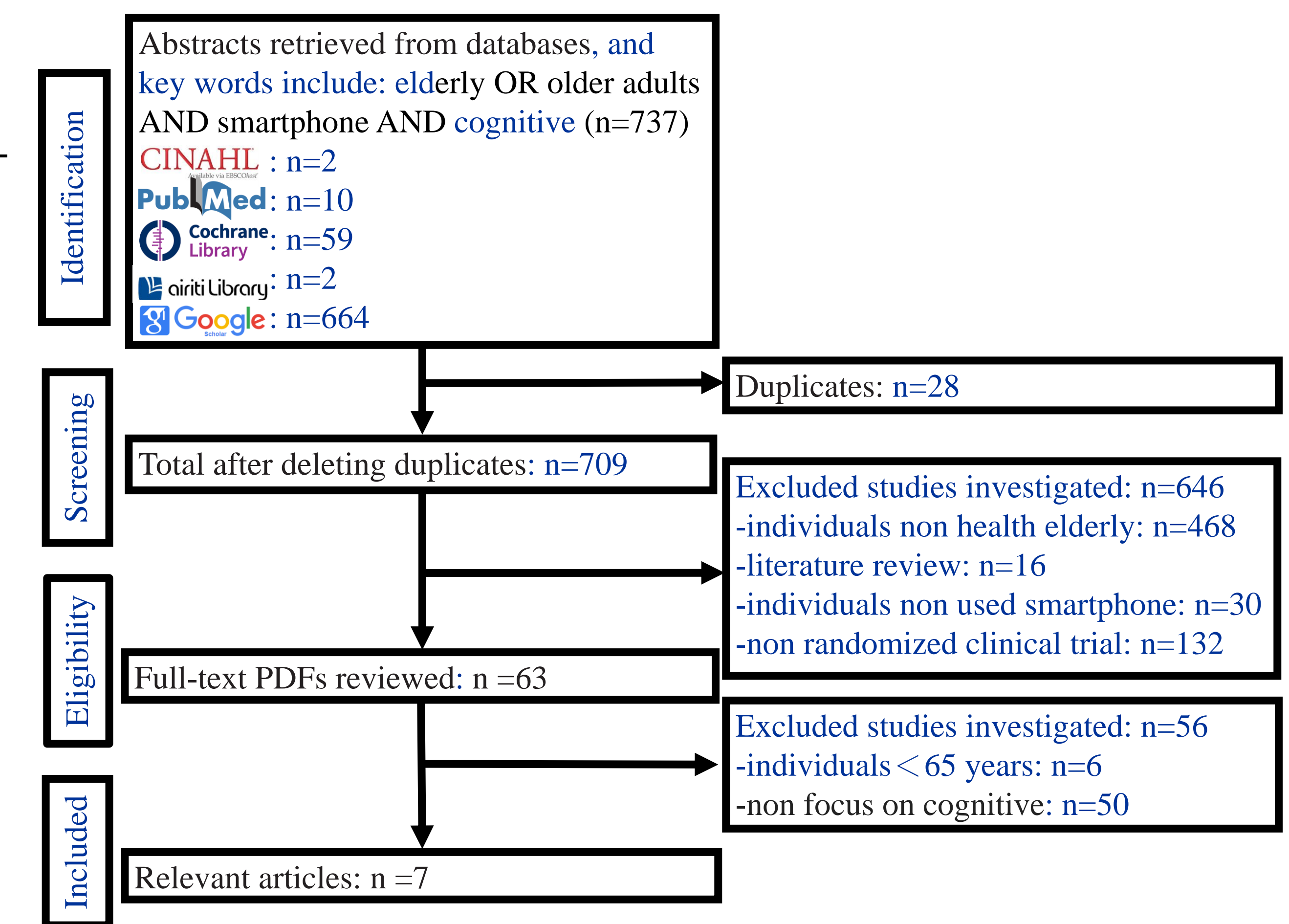

FIGURE 1. Focused literature review flow chart